

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of)

Brune et al.)) Examiner: **Gerard Strecker (Anticipated)**) Art Unit: **2862 (Anticipated)**Serial No: **Not Yet Assigned**)) Attorney Docket: **DCI-P017C**Filed: **May 10, 2001**)) Date: **May 10, 2001**For: **SKIN DEPTH COMPENSATION IN UNDERGROUND)
BORING APPLICATIONS)**

CERTIFICATE OF MAILING I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231 on **May 10, 2001**.

Signed: 

Jay R Beyer

Preliminary Amendment

Assistant Commissioner of Patents
Washington, D.C. 20231

Dear Sir:

Please enter the following preliminary amendment which is being filed together with the subject application.

In the Specification

At page 6, line 1, between "serial no. 08/835,834, " and "filing date" please add --now U.S. Patent Number 6,035,951, --.

At page 10, line 21, please replace the first blank with --09/317,308--, please replace the second blank with --May 24, 1999--, and please delete "(attorney docket no. DCI-P018)".

In the Claims

Please cancel claim 1 as well as claims 2-47 as indicated in the application transmittal. Also, please add new claims 48- as indicated below.

48. In a system in which a boring tool is moved underground in a region during selective rotation of the boring tool, a method comprising the steps of:

configuring the boring tool with a transmitter for transmitting a locating signal for use in tracking an underground position of the boring tool in said region and for changing at least one characteristic of said locating signal responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

49. The method of Claim 48 wherein said predetermined roll sequence includes at least one roll rate.

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50. The method of claim 48 wherein said boring tool includes a roll sensor and further comprising the steps of:
selectively rotating the boring tool using the drill string to subject the boring tool to the predetermined roll sequence; and
detecting said predetermined roll sequence using the roll sensor and, responsive thereto, changing said characteristic.

51. In a system in which a boring tool is moved underground in a region during selective rotation of the boring tool, a method comprising the steps of:

configuring the boring tool with a transmitter for transmitting a locating signal for use in tracking an underground position of the boring tool in said region at a selected frequency and for changing the selected frequency of said locating signal responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

52. In a system in which a boring tool is moved underground in a region during selective rotation of the boring tool, a method comprising the steps of:

configuring the boring tool with a transmitter for transmitting a locating signal having a power level for use in tracking an underground position of the boring tool in said region and for changing said power level responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

53. In a boring tool for use in a system in which the boring tool is moved underground in a region during selective rotation of the boring tool, an assembly comprising:

a first arrangement for transmitting a locating signal from the boring tool for use in tracking an underground position of the boring tool in said region; and

a second arrangement, cooperating with said first arrangement, for changing at least one characteristic of said locating signal responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

54. The assembly of Claim 53 wherein said second arrangement is responsive to at least one roll rate forming at least part of the predetermined roll sequence.

55. In a boring tool for use in a system in which the boring tool is moved underground in a region during selective rotation of the boring tool, an assembly comprising:

a first arrangement for transmitting a locating signal at a selected frequency from the boring tool for use in tracking an underground position of the boring tool in said region; and

a second arrangement, cooperating with said first arrangement, for changing the selected frequency responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

56. The assembly of Claim 55 wherein the boring tool is moved using a drill string and wherein said assembly further comprises a roll detection arrangement forming part of said second arrangement for detecting the predetermined roll sequence.

57. In a boring tool for use in a system in which the boring tool is moved underground in a region during selective rotation of the boring tool, an assembly comprising:

a first arrangement for transmitting a locating signal from the boring tool having a power level for use in tracking an underground position of the boring tool in said region; and

a second arrangement, cooperating with said first arrangement, for changing the power level of said locating signal responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

58. The assembly of Claim 57 wherein the boring tool is moved using a drill string and wherein said assembly further comprises a roll detection arrangement forming part of said second arrangement for detecting the predetermined roll sequence.

59. In a system in which a boring tool is moved underground in a region during selective rotation of the boring tool, a method comprising the steps of:

configuring the boring tool for transmitting a locating signal for use in tracking an underground position of the boring tool in said region and for control of at least one function in the boring tool responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

60. In a system in which a boring tool is moved underground in a region during selective rotation of the boring tool, said boring tool transmitting a locating signal and said system including a receiver for receiving the locating signal, a method comprising the steps of:

controlling at least one function in the boring tool responsive to subjecting the boring tool to a predetermined roll sequence during underground operation; and

sending encoded data from the boring tool related to said function for reception by the receiver.

61. The method of claim 60 wherein said locating signal is transmitted at a selected frequency and the step of controlling said function includes the step of frequency controlling the locating signal.

62. The method of claim 60 wherein said locating signal is transmitted having a power level and the step of controlling said function includes the step of power controlling the locating signal.

63. The method of claim 62 wherein the power controlling step includes the step of sending at least encoded data which allows the receiver to adjust to a new signal strength of the locating signal.

64. The method of claim 60 wherein said predetermined roll sequence includes at least one roll rate.

65. The method of Claim 60 wherein said boring tool is movable using a drill string, said method further comprising the steps of:

selectively rotating the boring tool using the drill string to subject the boring tool to the predetermined roll sequence; and

detecting said predetermined roll sequence using the boring tool and, responsive thereto, controlling said function.

66. In a boring tool for use in a system in which the boring tool is moved underground in a region during selective rotation of the boring tool, an assembly comprising:

a first arrangement for transmitting a locating signal from the boring tool for use in tracking an underground position of the boring tool in said region; and

a second arrangement for controlling at least one function in the boring tool responsive to subjecting the boring tool to a predetermined roll sequence during underground operation.

67. The assembly of claim 66 wherein said system includes a receiver for receiving the locating signal and said assembly includes a third arrangement, cooperating with the first and second arrangements, for sending encoded data related to said function for reception by the receiver.

68. The assembly of claim 66 wherein said locating signal is transmitted at a selected frequency and said function is frequency selection of the locating signal.

69. The assembly of claim 66 wherein said locating signal is transmitted having a power level and said function is power selection of the locating signal.

70. The assembly of claim 69 wherein the system includes a receiver at least for receiving the locating signal and wherein said assembly includes a third arrangement, cooperating with the first and second arrangements, at least for sending encoded data to allow the receiver to adjust to a new signal strength of the locating signal.

71. The assembly of claim 66 wherein said second arrangement detects at least one roll rate as part of the predetermined roll sequence.

72. In a system in which a boring tool is moved underground in a region during selective movement of the boring tool by a drill string, said boring tool transmitting a locating signal at least for tracking the underground position of the boring tool using a locator, a method comprising the steps of:

transmitting a control signal from the surface of the ground to the boring tool using the drill string;
responsive to said control signal at the boring tool, changing at least one characteristic of the locating signal; and
encoding data, at the boring tool, related to changing the characteristic for transmission to the locator.

73. The method of claim 72 wherein said characteristic is the power level of the locating signal and the encoded data includes a new signal strength.

74. The method of claim 72 wherein said characteristic is the frequency of the locating signal and the encoded data includes frequency control information.

75. In a system in which a boring tool is moved underground in a region during selective movement of the boring tool by a drill string, said boring tool transmitting a locating signal at least for tracking the underground position of the boring tool using a locator, an assembly comprising:

a first arrangement for transmitting a control signal from the surface of the ground to the boring tool using the drill string;

a second arrangement, forming part of the boring tool, which is configured to respond to said control signal by

changing at least one characteristic of the locating signal and, thereafter, for encoding data related to changing the characteristic for transmission to the locator.

76. The assembly of claim 75 wherein said characteristic is the power level of the locating signal and the second arrangement encodes data including a new signal strength.

77. The assembly of claim 75 wherein said characteristic is the frequency of the locating signal and the second arrangement encodes data including frequency control information.

78. In a system in which a boring tool is moved underground in a region during selective movement of the boring tool by a drill string, said boring tool transmitting a locating signal at least for tracking the underground position of the boring tool using a locator, a method comprising the steps of:

transmitting a control signal from the surface of the ground to the boring tool using the drill string;
responsive to said control signal at the boring tool, controlling at least one function in the boring tool; and
encoding data, at the boring tool, related to the function for transmission to the locator.

79. In a system in which a boring tool is moved underground in a region during selective movement of the boring tool by a drill string, said boring tool transmitting a locating signal at least for tracking the underground position of the boring tool using a locator, an assembly comprising:

a first arrangement for transmitting a control signal from the surface of the ground to the boring tool using the drill string;

a second arrangement, forming part of the boring tool, which is configured for controlling at least one function in the boring tool responsive to said control signal and, thereafter, for encoding data related to the function for transmission to the locator.

Remarks

If the Examiner has any questions concerning this case, the Examiner is respectfully requested to contact Mike Pritzkau at (303) 410-9254.

Respectfully submitted,



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